REMARKS

This Amendment is in response to the Office Action dated September 30, 2005. In the Office Action:

- Claims 16-17 are rejected under 35 U.S.C. § 112, second paragraph, for insufficient antecedent basis for some limitations in the claims.
- Claims 1-5 and 12-13 are rejected under 35 U.S.C. §102(b) as unpatentable over Johnson (U.S., Patent No. 5,606,444); and
- Claims 6-11 are rejected under 35 U.S.C. §103(a) as unpatentable over Johnson in view of Ruziak (U.S. Patent No. 6,256,296).

Reconsideration of the rejected claims and the newly added claims are respectfully requested.

Claims 16-17 have been amended to correct errors associated with insufficient antecedent basis. Therefore, the rejections thereof under 35 U.S.C. § 112, second paragraph, should be withdrawn.

Johnson teaches a free-space optical communications system, including a pair of transceivers, each of which includes a separate optical transmitter 36 and an optical receiver 38 (Col. 4, lines 27-35). The optical transmitter 36 includes one or more infrared light emitting diodes (LEDs) 42 (Col. 4, lines 51-52). Because the infrared light produced by the one or more LED 42 extends at wide angles from the face of the LED, a beam-forming horn 44 is placed around the LED 42. As a result, the beam-forming horn 44 collects the infrared light and directs it towards the corresponding optical receiver 38 (Col. 4, lines 62-66). The optical receiver 38 includes an infrared window 50b. Infrared light traveling through the infrared window 50b is collected by a dielectric compound parabolic concentrator (CPC) 64 (Col. 5, lines 37-41).

Ruziak teaches an IR receiver 66 in a wireless communication link as comprising a photodiode 82, which includes an optically active area 86. A non imaging dielectric totally-internally-reflecting concentrator 88 is optically coupled at an exit surface 84 thereof to area 86, using a suitable optical bonding material (col. 7, lines 58-63).

Claim 1 as amended is patentable over Johnson or Ruziak or their combination by calling for an apparatus for wireless duplex communication, comprising, a first optical transceiver having a first optical transmitter and a first optical receiver, a second optical transceiver having a

first optical transmitter and a first optical receiver, the first and second optical transceivers being located at opposite ends of an optical communication line formed thereby, wherein the output of each of the optical transmitters is a diverging beam of incoherent electromagnetic radiation arranged to have a cross sectional diameter which is larger than the cross sectional diameter of the respective optical receiver at that point on the communication line at which the respective optical receiver is situated, wherein each of the optical receivers includes an optical condenser lens having a focal plane, a photodiode, and a diaphragm having an aperture and situated in the focal plane of the optical condenser lens between the optical condenser lens and the photodiode, wherein the distance Δ between the diaphragm and the photodiode is defined by $\Delta=bF/Dc$, where b is the diameter of a light-sensitive site of the photodiode, Dc is the diameter of the optical condenser lens, and F is a focal distance of the optical condenser lens, and wherein a beam angle θ characterizing the first transmitters and the first receivers is defined by $\text{Tan } 2\theta=a/F$, where a is the aperture of the diaphragm.

As acknowledged by the Examiner, Johnson does not teach the claimed feature of an optical receiver including an optical condenser lens, a photodiode, and a diaphragm situated in a focal plane of the optical condenser lens and between the optical condenser lens and the photodiode. Contrary to the assertion of the Examiner, however, Ruziak does not disclose a diaphragm of the type called for in amended Claim 1. In this regard, the Examiner has considered exit surface 84 of Ruziak to be similar to the diaphragm in amended Claim 1. But, a diaphragm, as is generally known in the field of optics and as is defined in the Merriam-Webster Dictionary, is a device that limits the aperture of a lens or optical system. The exit surface 84 of the concentrator 88 in Ruziak is not such a device and cannot be considered as a diaphragm.

Furthermore, neither Johnson nor Ruziak discloses or teaches, among other things, the claimed feature that the distance Δ between the diaphragm and the photodiode is defined by $\Delta=bF/Dc$, where b is the diameter of a light-sensitive site of the photodiode, Dc is the diameter of the optical condenser lens, and F is a focal distance of the optical condenser lens. In Ruziak, the exit surface 84 is part of the totally-internal-reflecting concentrator 88, which does not have a focal plane, and the active area 86 of the photodiode 82 is bond to the exit surface 84, instead of being distanced from it by a distance Δ defined by $\Delta=bF/Dc$. Therefore, the Examiner's assertion that this claimed feature is taught by the combination of Johnson and Ruziak is without merit.

Moreover, neither Johnson nor Rusiak discloses of teaches, among other things, the claimed feature that a beam angle θ characterizing of the transmitters and the receivers is defined by the formula Tan 2θ=a/F. In Johnson, the beam angle of the transmitter 36 is defined by the dimensions of the beam-forming horn, which are chosen depending on the size of the target area and the separation between the transceivers (col. 5, lines 4-6), and not depending on the internal configuration of the receiver 38, as the formula in amended Claim 1 dictates. In Ruziak, concentrator 88 has an acceptance angle θ, which is designed to meet the needs of a diffuse IR communications link by proper selection of the shape of the concentrator and of an entrance surface of the concentrator (col. 8, lines 9-14), which is designed to give θ in the range of 40-50° and not by the formula in amended Claim 1, which would give a much smaller angle.

Therefore, Claim 1 as amended is patentable over Johnson and Ruziak, individually and combined.

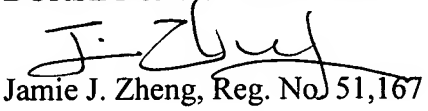
Claims 2-6, 8, and 10-17 depend from Claim 1 and are patentable for the same reasons as Claim 1 and by reasons of the additional limitations set forth therein.

The arguments regarding Claim 1 apply to new Claim 18. In addition, new Claim 18 calls for the beam angle characterizing of the transmitters and receivers of the wireless duplex communication apparatus to be about 30 to 60 angular minutes, which is not taught in either Johnson or Ruziak. Therefore, new Claim 18 is also patentable.

New Claims 19-20 depend from Claim 18 and are patentable for the same reasons as Claim 18 and by reasons of the additional limitations set forth therein.

Based on the foregoing, Applicants respectfully submit that the application is now in condition for allowance. If any matters can be resolved by telephone, the Examiner is invited to call the undersigned attorney at the telephone number listed below.

Respectfully submitted,
DORSEY & WHITNEY LLP



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